

## Analysis of Sago Contribution as Staple Food Alternatives to Household Food Security

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This present study attempted to discuss the changing consumption patterns of Sago and rice in Pancakarsa village, Mangkutana District, East Luwu Regency, South Sulawesi, with a focus on the contribution of Sago to household food security. Rice has replaced Sago as the preferred staple food among the local community, but Sago still has an essential value as a traditional and alternative basic food item. The study aims to understand Sago's role as a household basic food comprehensively. Data were collected through interviews with 15 respondents (representing 152 households) employing quantitative descriptive analysis. The analyzed data consisted of primary data from interviews with respondents and secondary data from relevant institutions, including village officials and the Central Bureau of Statistics. The results demonstrated that the educational degree of respondents ranged from Primary School (66.7%), Junior High School (26.7%), to Senior High School (2.67%). Sago's contribution to household basic food security is classified as moderate, while rice is in the high category. The theoretical and managerial implications of these findings are discussed in the present study. Some Sago-based traditional food products produced by Pancakarsa villagers included *Kapurung*, *Sinole*, *Dange*, *Bagea*, *Ongol-ongol*, and *Cendol*. These carbohydrate sources contain good nutrition. Promoting Sago as local food may also be linked to efforts to maintain food diversity and environmental sustainability.

**Keywords:** Food consumption pattern, household food contribution, household, rice, Sago .

### INTRODUCTION

Sago (*Metroxylon sagu* Rottb) is a starch-producing plant with great potential, especially in eastern Indonesia (Sidiq *et al.*, 2022). Sago is a staple food for Maluku, Papua, Mentawai, and other Indonesian regions. Its high carbohydrate content makes Sago a potential alternative to rice. Although many inland communities still consume Sago as a staple food, its utilization is limited. Sago has a vital role in overcoming national food shortages and reducing dependence on rice (Fioletta *et al.*, 2018). In addition, the calorie and nutritional content of Sago is not inferior to other food sources. Unfortunately, the government has not given enough attention to the potential of local foods, including Sago. The consumption pattern of people who switch to rice has caused food insecurity in various regions. Local food resources like Sago can help meet household food needs and strengthen regional food security reserves (Rahayu *et al.*, 2023 ). To

achieve this, it is necessary to manage and utilize Sago properly. Local governments should be concerned with developing and using local food resources, including Sago, to ensure household food security on a regional and national scale. Sago has a strategic role in efforts to develop food diversity in the region to support food security because. Traditional raw materials are available on a site-specific basis. Traditional food is products with high cultural taste which are a combination of creative processing of local resources with spiced tastes and customs that have been passed down through down and down. Therefore, traditional food can be used as a means for realizing food diversity in strengthening food security traditional (Nur'aini, 2020). Sago is a food-crop commodity with great potential as a source of carbohydrates in Indonesia (Fioletta *et al.*, 2018). Although Sago is still developed traditionally and is limited, the government strives to establish Sago nationally. Diversification of food products and consumption focuses on maintaining national food

Fitriyah, A.T., Baharuddin, A.C.A. Sheyoputri, S. Salam and S.N. Sirajuddin. 2025. Analysis of sago contribution as staple food alternatives to household food security. Journal of Global Innovations in Agricultural Sciences 13:1059-1067.

[Received 3 Aug 2024; Accepted 20 Jan 2025; Published 21 Jun 2025]



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security. The distribution of healthy and nutritious essential food items is vital to provide people with alternatives other than rice (Konuma, 2018). Sago is also known as a versatile plant in Papua. Apart from being a starch source for staple foods such as *Papeda*, Sago is also used for other household purposes, such as construction materials and firewood (Fitriani *et al.*, 2023). Regarding the Sago's nutritional content, there are sufficient amounts of carbohydrates. In addition, Sago also contains protein, vitamins, and minerals. In 100 grams of carbohydrates, there are 0.2 grams of protein, 0.5 grams of fiber, 10 mg of calcium, and 1.2 mg of iron (Rahayu *et al.*, 2023). In addition to its function as an energy booster, Sago has many other benefits, such as controlling cholesterol, promoting healthy digestion, maintaining healthy bones and joints, and improving body fitness. The strategic role of Sago in developing local food in the region is significant because traditional raw materials are available specifically in each location. Traditional food from Sago has high cultural value and is part of the cultural heritage. South Sulawesi has excellent potential for Sago farming development, especially in the Greater Luwu region. Pancakarsa village in East Luwu Regency is one of the areas with abundant Sago potential. The village community has produced enough Sago to fulfill household food needs. Sago is processed into traditional foods such as *kapurung*, which is highly favored by the local community. Utilizing Sago as a food alternative to rice can reduce people's dependence on rice. However, more research and development are needed to maximize the contribution of Sago in meeting household food needs (Noer *et al.*, 2023). More in-depth studies can be conducted to optimize Sago cultivation techniques, increase crop productivity, and develop efficient processing methods. In addition, efforts can be made to diversify Sago products, such as creating more diverse and value-added processed Sago products (Duffy *et al.*, 2021). Thus, people can have more varied and balanced food options. In addition to technical aspects, social and educational approaches are also essential to encourage the use of Sago as an alternative food (Sidiq *et al.*, 2022). People need to understand the benefits and potential of Sago as a sustainable food source. The government can also provide incentives and policy support to encourage a more extensive development of Sago (Pramana *et al.*, 2021). The potential of Sago as a food alternative can be optimized sustainably by involving various relevant parties, including farmers, researchers, government, and local communities. This will help reduce people's dependence on rice, maintain national food security, and promote regional food diversity with high cultural value. Pancakarsa village, located in Mangkutana district, East Luwu regency, has excellent potential in Sago production and processing. Sago is an essential commodity for the people of this village and is used as a staple food in their daily lives (Yusriadi *et al.*, 2022). However, no in-depth research has determined how much Sago contributes to household food security in Pancakarsa village. The aim of this

research is to find out; 1. How big is the role of Sago as a staple food in ensuring household staple food security in Pancakarsa Village, Mangkutana District? 2. How does Sago contribute to providing carbohydrates and nutrients needed by village communities? 3. Has diversification of Sago products been carried out to meet nutritional needs better? 4. How is society's dependence on Sago compared to rice as the main source of carbohydrates? To answer these questions, it is necessary to conduct research involving direct surveys of village communities, interviews with Sago farmers, and analysis of Sago's nutritional content and role in community consumption patterns. The results of this research are expected to provide a better understanding of the contribution of Sago to household food security in Pancakarsa village. In addition, this research is also likely to offer recommendations and strategies for Sago development that are more effective in maintaining food security and improving the welfare of rural communities. The study conducted in Pancakarsa village, Mangkutana sub-district, aims to reveal Sago's contribution to the household's basic food security. In this context, the contribution of Sago can be measured from the aspects of availability, consumption, and diversification of Sago products. First, a direct survey of the village community is performed to identify the extent to which Sago is integral to their consumption patterns. Data on the frequency and amount of Sago consumption will be collected, including traditional preparations such as *papeda*, Sago pancake, *sinole*, and other products produced from Sago. In addition, information on people's consumption preferences and understanding of the nutritional value of Sago will also be obtained. In addition, this study will analyze the extent to which the village community has carried out Sago product diversification. This aspect is essential because diversification of Sago products can increase the added value of Sago and provide more diverse food alternatives for the community. Information on existing processed Sago products and community responses to this diversification will be collected through interviews and direct observation. The results of this study are expected to provide a deeper understanding of the contribution of Sago to household food security in Pancakarsa village. The data and findings can be the basis for developing better strategies to enhance Sago's role in food security and the welfare of village communities. This research can also serve as a basis to promote similar initiatives in utilizing Sago's potential in other areas and expand the use of Sago as a food alternative with high cultural and nutritional value. The role of Sago is viewed from social or cultural aspects with qualitative and descriptive economic analysis of Sago farmers' income. The research results prove that the social or cultural role of Sago is seen as a traditional plant that has been consumed for generations, there are also several traditions and customs that maintain the value of life known as local wisdom, this is reflected in the behavior of the Sago community. Baloli Village, especially cultivating Sago and other plant parts such



as leaves, can also be used for crafts to make roofs and the remaining bark is used as firewood, and the dregs are used as animal feed. From an economic aspect, the biggest income is for farmers who have their own Sago plants and process them into Sago flour, even though the quantity is limited and not yet able to support household and community food security (Hikmah *et al.*, 2022).

## MATERIALS AND METHODS

**Sources of data:** The study was conducted in Pancakarsa Village, Mangkutana District, East Luwu Regency, South Sulawesi, due to its significant Sago processing sites and high Sago consumption rates among its residents. This location provides a relevant context for examining Sago's role in household food security.

**Population and research sample:** The population for this study comprised 152 households with regular Sago consumption in Pancakarsa Village. A simple random sampling technique was employed, selecting 15 households (10% of the population) as the sample (see Table 1). These households regularly incorporate Sago into their diets. The selection aimed to represent diverse household characteristics, including age, education level, family size, and Sago consumption rate, to offer a comprehensive understanding of Sago's role in food security.

**Table 1. Respondent characteristics (n = 15).**

Age (Years)	Total (Individuals)	%
15-29	2	13.4
30-44	4	26.6
45-59	6	40.0
>60	3	20.0
Education level	Total (individuals)	%
Primary School	10	66.7
Secondary School	4	26.7
Senior High School	1	6.6
No. of dependents (individuals)	No. of respondents	%
1-5	12	80.0
6-10	3	20.0

**Data collection:** Primary data were gathered through observations and structured interviews, focusing on respondent demographics and Sago consumption patterns. Secondary data were sourced from village officials and the Central Bureau of Statistics. Data collection involved recording household food expenditures and Sago usage, which were analyzed descriptively.

The method used to collect data in this research is:

1. Observation, namely direct observation at the research location in Pancakarsa Village, Mangkutana District, East Luwu Regency, South Sulawesi.

2. Interviews are data collection and are given orally, interviews are conducted face to face with the resource person, namely 15 households who are used to and routinely include Sago in their daily food in Pancakarsa Village, Mangkutana District, Regency East Luwu, South Sulawesi.
3. Literature study is data collection by utilizing data sources related to research such as books, journals, theses and dissertations, as well as other relevant sources.

**Data analysis:** Data analysis utilized quantitative descriptive methods to assess Sago's contribution to household food security. The contribution of Sago was calculated using the following formula:

$$C = \frac{y}{x} \times 100\% \quad C = \frac{y}{x} \times 100\%$$

where C represents the contribution percentage, y is the monthly expenditure on Sago (IDR), and x is the total monthly expenditure on staple foods (IDR). This calculation allows for a comparative assessment of Sago's contribution relative to overall food costs

The formula is presented in the following:

$$C = \frac{y}{x} \times 100\%$$

C= Contribution; y= Sago consumption per month (IDR); x= consumption of all staple foods per month (IDR)

**Current conditions:** The study includes demographic analysis of Pancakarsa Village, as detailed in Table 2 and Table 3, to understand population distribution by sex and age. This data informs the study's context, highlighting the demographic profile's relevance to Sago consumption patterns and food security.

**Sago Processed Products:** Pancakarsa Village is noted for its traditional Sago-based dishes such as kapurung, sinole, dange, bagea, and ongol-ongol. These products are integral to local cuisine and food security. Table 4 provides an overview of these processed products, reflecting the village's rich culinary heritage and Sago's role in daily life.

## RESULT

**Current condition of the research object:**

**a. Residents:** Table 1 presents data on the population and sex ratio of the three hamlets in Pancakarsa village, Mangkutana district, East Luwu regency, in 2022. The table provides an overview of the distribution of the population by sex in each hamlet, as well as the sex ratio, which can be used as an indicator of the ratio of men and women. This data is vital in understanding the demographic structure and composition of the population in the area. The table also indicates whether there is a significant difference between the number of men and women in each sub-village and whether the sex ratio shows different trends among the sub-villages. By evaluating the data, it will become apparent whether there are consistent patterns or significant differences in the population distribution by gender in Pancakarsa village. This information



can provide valuable insights into development planning and policies related to the population in the area. A more detailed description of the population and sex ratio of Lopi, Matallo, and Tawibaru hamlets, as well as the total population of Pancakarsa village (1725 individuals) in 2022, is presented in the following Table.

**Table 2. Total Population and Sex Ratio of Hamlets in Pancakarsa Village, Mangkutana Subdistrict, East Luwu Regency in 2022.**

Hamlets	Gender		Total	Gender Ratio
	Men	Women		
Lopi	277	259	536	106.94
Matallo	317	348	665	91.09
Tawibaru	279	271	550	102.95
Pancakarsa village	873	878	1,725	99.43

Based on Table 2, indicates that Lopi has a total population of 536 with a sex ratio of 106.94, implying the slightly dominant number of men compared to the women. Matallo has a population of 665 with a sex ratio of 91.09, which means a somewhat higher number of women than men. Tawibaru has a population of 550 with a sex ratio of 102.95, indicating more men than women. The total population of Pancakarsa village is 1,725, with a sex ratio of 99.43, which implies a balanced ratio of men and women in the town. Table 2 also provides information on the age groups and gender of the villagers' population. Data on population size by age group and gender has significance in understanding the demographic structure of a population. Through this table, it is possible to analyze the population distribution pattern in each age group and the ratio of the number of men and women in each group. Understanding the composition of the population by age group and sex is essential in various aspects of development and policy planning, such as in the health, education, and social service sectors. The information in this table can serve as a relevant basis for identifying community needs by age group and influencing the appropriate planning of programs to the characteristics of the local population. Through this data, understanding the demographic structure of the population of Pancakarsa village, Mangkutana sub-district would be much more possible.

Based on Table 3 above shows population data by age group and sex in Pancakarsa village, Mangkutana District, East Luwu Regency, in 2022. This table provides information on the population distribution within specific age groups and shows the ratio of men and women in each age group. This data is essential in describing the demographic structure of the village population. The table divides age groups into specific ranges, from 0-4 year-old to over 75 year-old age group. Each age group has male and female categories and the total number of residents in each group. Table 2 shows the population distribution pattern by age group and gender in

Pancakarsa village. For example, most residents are in the 10-14 year-old age group, followed by the 15-19 year-old age group. In addition, the table also shows the ratio of the number of males and females in each age group. By understanding the data, the village's population structure can be recognized, and valuable insights in planning development policies and community service programs that align with the population needs of each age group can be provided.

**Table 3. Total population by age group in Pancakarsa village, Mangkutana subdistrict, East Luwu Regency in 2022.**

Age Groups	Gender		Total
	Men	Women	
0-4	60	63	123
5-9	68	65	133
10-14	93	95	188
15-19	83	101	184
20-24	90	65	155
25-29	61	75	136
30-34	62	61	123
35-39	68	69	137
40-44	67	68	135
45-49	61	61	122
50-54	47	50	97
55-59	37	34	71
60-64	27	23	50
65-69	17	19	36
70-74	17	15	32
>75	15	14	29
Total	873	878	1,751

**b. Sago availability for household food security:** Rice and Sago are the household staple foods in Pancakarsa village. Although Sago consumption is shifted by the more dominant consumption of rice in the community, Sago remains the second staple food favored by the local population. The use of Sago daily or weekly is not only limited to specific events but is consumed in various processed products (Metaragakusuma *et al.*, 2017). Not only the residents but also the migrants enjoyed the delicacy of Sago. Household food availability is generally supplied through farm production or purchases (Ratnawati, 2022). Their production provides households with sufficient food availability, such as rice and Sago. Meanwhile, households that do not produce Sago fulfill their needs by buying Sago from markets or manufacturers because Sago is relatively easy to obtain (Manusawai *et al.*, 2019). As an alternative staple food, household staple food availability is supported by commodities such as rice and Sago. Sago is considered a preferred and frequently consumed rice substitute in Pancakarsa village because Sago is easy to process, has a carbohydrate content almost equivalent to rice, and has good nutritional value (Yusuf *et al.*, 2023). The Sago





supply pattern begins with manufacturers and distributors who sell Sago to households in Pancakarsa village. Therefore, each household will have no obstacles in obtaining Sago. The availability of Sago in the community is guaranteed due to adequate distribution channels, making it easier for every household to fulfill their food needs with Sago (Pramana *et al.*, 2021; Rahayu *et al.*, 2023; Ratnawati, 2022). Such detail can be interpreted through the results of our interviews with respondents.

*"Sago is the second staple food we often consume daily in our house. We enjoy the variety of Sago flavors, and the commodity has good nutritional content."*

*"As a native resident of Pancakarsa village, Sago has become an integral part of our consumption. We processed Sago into various food products and consider it an important food source."*

*"While rice remains our main choice, Sago has a special place in our family's diet. We appreciate the practicality and deliciousness of Sago as a meal replacement."*

*"We are migrants in Pancakarsa village and are happy to find Sago as a popular food alternative here. We tried eating Sago in various dishes and were impressed with the taste."*

*"Our household produces its Sago and consumes it regularly. We feel proud to be able to take advantage of Sago as a nutritious and valuable food ingredient."*

*"Sago is a cultural heritage in Pancakarsa village, and we continue to honor this tradition by consuming Sago in our daily meals. We feel that Sago gives our meal a unique identity."*

*"In our home, Sago is not only consumed on special occasions but is also a regular part of daily life. We enjoy the sensation of the texture and flavor of Sago in our dishes."*

New strategy in providing solutions to increase food security and independence through optimizing processed Sago products. Meeting regional needs in the consumption of basic commodities requires other alternatives to avoid product shortages and increase regional potential in developing the seed sector. The result is an increase in processed Sago products and making them superior products that are able to compete in national and global markets.

**c. Sago processed products:** Pancakarsa village has a rich traditional culinary heritage, where the community uses Sago as a prevalent traditional food ingredient. In their daily lives, Pancakarsa villagers often consume a variety of traditional dishes made from Sago, such as *kapurung*, *sinole*, *dange*, *bagea* and *ongol-ongol*. These dishes are processed by cooking Sago flour with spices and fish or by molding the Sago using leaves into various cakes. Pancakarsa Village can offer a variety of Sago processing that is part of their local culinary richness. These food products are presented in Table 4.

Baerd on Table 4, shows the types of processed Sago products in Pancakarsa village and their categories. These processed Sago products in Table 4 are popular in the town. *Kapurung*

is processed Sago products that are consumed as a meal. *Kapurung* is a traditional dish with a rich flavor and soft texture made from Sago, spices, and fish as its main ingredients. Other Sago-processed products commonly served as snacks include *dange*, *bagea*, *sinole*, and *ongol-ongol*. *Bagea* is a crunchy texture Sago-based cake. *Ongol-ongol* is a Sago-based sweet cake with a round shape and chewy texture coated with grated coconut and sugar. *Sinole* is a traditional cake made from steamed Sago and sugar dough. Another Sago-based product commonly used as an ingredient in drinks is *Cendol*. *Cendol* is Sago dough cut into noodle-like shapes and is served with coconut milk and brown sugar. Different types of processed Sago in Pancakarsa village reflect the diversity of traditional culinary practices that use Sago as the main ingredient. Pancakarsa villagers have developed recipes and Sago processing techniques to create delicious and unique food. *Kapurung*, *sinole*, *dange*, *bagea*, and *ongol-ongol* are clear examples of Sago-based culinary innovations produced by the people of Pancakarsa village. The use of Sago in these various processed products enriches the variety of food and preserves the traditions and cultural identity of Pancakarsa village.

**Table 4. Sago processed products in Pancakarsa village.**

Processed products	Product category
<i>Kapurung</i>	Meal
<i>Dange</i>	Snacks
<i>Bagea</i>	Snacks
<i>Sinole</i>	Snacks
<i>Ongol-ongol</i>	Snacks
<i>Cendol</i>	Drink

**Fulfillment of household food consumption:** Communities in Pancakarsa village have diverse household food needs, and they tend to consume food according to the needs and preferences of each individual or group. The results of the interviews revealed variations in the intensity of Sago consumption in respondents' households. Sago was previously often consumed by the people of Pancakarsa village as staple food shifted to a side dish. The interviews found that households that tend to consume Sago regularly are household groups with elderly members. However, other households still consider Sago a staple food consumed daily in significant quantities. Rice has replaced Sago as a more preferred staple food by Pancakarsa villagers. The main reason is that cooking rice is more practical and does not require any other complementary ingredients. Although Sago consumption has decreased as a staple food, processed foods from Sago have not been abandoned. For example, some new household respondents living in Pancakarsa village are still very fond of *kapurung*, and this is influenced by habits passed on from their parents. This suggests that Sago still plays a vital role in Pancakarsa's community today. This is consistent with the results of our interviews with respondents as below:



Question: What do you think about the shift in consumption of Sago as a staple food in Pancakarsa village, which has been replaced by rice?

"Yes, it is true that rice has replaced Sago as the preferred staple food for most people in Pancakarsa village. The main reason behind this change is that rice is more practical and does not require as many side dishes or vegetables as a complement if there are no other complementary foods. I also observed that people now prefer rice because it can be easily found in the market and has a variety of processing methods. However, although Sago consumption has decreased as a staple food, our community has not completely abandoned Sago-based processed foods. For example, among some of the newer households in Pancakarsa village, like my family, we are still very fond of traditional Sago foods such as kapurung. This is because we still maintain the habits and heritage of our parents, who have always considered Sago an important part of our culture. Therefore, although Sago may no longer be the main staple food, it still plays an important role in our community, especially in traditional foods and the special cuisine of Pancakarsa village."

"I agree that rice has replaced Sago as the more popular staple food in Pancakarsa village. The main reason is convenience in serving, as rice is easier to prepare and does not require many side dishes or vegetables as a complement. I also consume rice more often than Sago in my daily life. However, despite the decline in Sago consumption, some Sago preparations remain in demand by our community, such as kapurung and dange. Some new families who moved to Pancakarsa village still preserve the Sago tradition and make it part of their typical dishes. So, even though rice has become the main option, Sago still plays an important role in our local culture and cuisine".

"In recent years, there has been a shift in staple food consumption in Pancakarsa village, with rice replacing Sago as the main choice. I also consume rice more often than Sago in my daily life. The main reason is that rice is easier to find in the market and has a simpler processing method. However, despite the decline in Sago consumption, some Sago preparations remain popular among our community, such as kapurung and ongol-ongol. As members of households from Pancakarsa village, we still maintain the tradition of consuming Sago on special occasions or when we want to experience its distinctive flavor. So, Sago still plays an important role in our community, even though it is no longer a daily staple food like before."

Based on Table 5, illustrates the pattern of food consumption, particularly rice and Sago, monthly in Pancakarsa village in 2022. The table provides information on the amount of food consumption by weight category (in kilograms), the number of individuals (people) involved, and the percentage of the total population. In rice consumption, three weight categories are measured, including 20-30 kg, 30-40 kg, and more than 40 kg. From the data provided, the number of respondents

who were rice consumers is 15, with a percentage of 100%. In the 20-30 kg weight category, there were 4 respondents, representing 27% of the total respondents. In the 30-40 kg weight category, there were 8 respondents, representing 53% of the total respondents. In the >40 kg category, there were 3 respondents, representing 20%. Three weight categories were measured on Sago consumption, including 5-10 kg, 10-20 kg, and >20 kg. The number of respondents who are Sago consumers was 15, representing 100% of the total respondents. In the 5-10 kg weight category, there were 7 respondents, representing 47%. On the 10-20 kg weight category, there were 7 respondents representing 47%. In the >20 kg weight category, only 1 respondent represented 6%. From the data, it can be concluded that most respondents have varied consumption of rice and Sago, with most respondents consuming higher amounts of rice than Sago. However, some respondents still consume a significant amount of Sago, indicating that Sago still has a vital role in food consumption patterns in Pancakarsa village.

**Table 5. Monthly staple food consumption in Pancakarsa village in 2022.**

Rice (kg)	People	%	Sago (kg)	People	%
20-30	4	27	5-10	7	47
30-40	8	53	10-20	7	47
>40	3	20	>20	1	6
Total	15	100	Total	15	100

Source: Processed Primary Data 2022

**Sago contribution rate:** Sago contribution rate is the contribution Sago gives to fulfill household food requirements, calculated in percentages. The contribution of Sago is one form of participation in household consumption of Sago food to meet their daily needs. The contribution of Sago to fulfilling household food requirements can be measured in the percentage of daily consumption. The following table provides an overview of the contribution rate to households.

**Table 6. Monthly consumption of staple foods in Pancakarsa village 2022.**

Food Type	Total
Rice	IDR. 4.700.000
Sago	IDR. 1.356.000
Total	IDR. 6.056.000

Source: Processed Primary Data 2022

#### **Contribution:**

$$\begin{aligned} \text{Rice} &= \text{rice cost} / \text{total cost} \times 100\% \\ &= 4.700.000 / 6.056.000 \times 100\% = 77\% \end{aligned}$$

$$\begin{aligned} \text{Sago} &= \text{saga cost} / \text{total cost} \\ &= 1.356.000 / 6.056.000 \times 100\% = 23\% \end{aligned}$$

From the above calculation results, Sago contribution in fulfilling household food reaches 23%, falling into the



medium category. Meanwhile, the contribution of rice appears to be 77% and can be classified as excellent or high. This suggested that Sago makes a significant contribution, although it is still in the medium category, while rice has an increased contribution to the household staple food requirement. Although the contribution of Sago to household food security is low, Sago remains the second staple food after rice, which is always available for secondary consumption by every family in Pancakarsa village. This is due to the high rice price that continues to increase each year. The villagers usually buy wet Sago for food for Rp. 35,000 per 5 kg and dried Sago with low water content for cakes or snacks for Rp. 10,000 per kg. Respondents or the community consume Sago at least 3 times a week, which implies that they consume Sago 12 times a month. However, if they run out of Sago, the community still consumes rice as the primary staple food. Sago becomes a food that is consumed occasionally but not abandoned. In addition to Sago consumption, Pancakarsa villagers also produce Sago by cutting down Sago trees and processing and packaging them. Sago can be obtained from the direct harvest of Sago trees or purchased from the local market. The processed Sago is collected by collectors or bought by the villagers at the Sago processing site. With the independent output of Sago and regular consumption, Sago plays a vital role in the Pancakarsa villagers' daily lives. This Sago production and consumption process also reflects local wisdom and food sustainability.

## DISCUSSION

In the previous section, Sago's role in household food security in Pancakarsa village has been discussed. Although Sago has experienced a decline in consumption as a staple food, Sago preparations are still being considered and remain an alternative for consumption among the local community. This shows that Sago is essential in food sustainability and daily life in Pancakarsa village. One of the factors influencing the shift in consumption from Sago to rice is the practicality of preparing rice, which does not require complementary ingredients. Nevertheless, Sago still upholds the cultural values in Pancakarsa village. This can be seen from new household respondents who are still very fond of traditional Sago foods such as *kapurung*, which is influenced by the habits passed on from their parents. This is in accordance with the opinion (Hikmah *et al.*, 2022). Sago is a plant that is used as a food source to meet daily needs. Sago plays a role in efforts to develop food diversification in the region to support food security because traditional raw materials are available specifically at the location. In the context of food sustainability, Sago has excellent potential. The people of Pancakarsa village carry out Sago production independently, from cutting down Sago trees to processing and packaging. This shows the existence of local wisdom and direct community involvement in the food production cycle. In

addition, Sago also has the advantage of being a source of carbohydrates with good nutritional content. This attention to Sago as a local food can also be linked to efforts to maintain food diversity and environmental sustainability (Yusriadi *et al.*, 2022). Using Sago as an alternative food option can help reduce dependence on rice, which is expensive and vulnerable to market fluctuations. Thus, Sago can play a role in maintaining food security in Pancakarsa village. Understanding Sago's role in food sustainability can be a comprehensive discussion. Further discussions can also focus on the potential for developing Sago as a sustainable local food, efforts to map and preserve Sago varieties, and innovative approaches in processing Sago into value-added products. In addition, marketing efforts and increasing the economic value of Sago as a unique local food source can also be explored. Through an in-depth discussion of the role of Sago in food sustainability in Pancakarsa village, appreciation of the local wisdom and community efforts in maintaining their traditional food sources can be addressed. The discussion can also involve social and cultural aspects of Sago consumption in Pancakarsa village, for example, how Sago is part of the identity and cultural heritage of the local community, as well as the role of Sago in rituals or traditional events. Apart from being a staple and traditional food, Sago also has the potential to be a source of income for the people of Pancakarsa village. In this discussion, the economic value of Sago can be analyzed, including the potential for developing local Sago businesses, making high-value processed Sago products, or marketing Sago as a culinary tourism product. In the context of global food sustainability, the role of Sago in Pancakarsa village can also be linked to issues such as food security, food diversity, and the impact of climate change. Discussions on sustainable Sago resource management strategies, efforts to conserve Sago genetic diversity, or adaptation to climate change to maintain stable Sago production can also be performed. Further discussion could also involve comparisons with similar cases in other regions or countries to see similarities and differences in the role of Sago in food sustainability. This could provide a broader understanding of this issue's local and global context. Sago can be linked to various essential aspects such as food sustainability, local wisdom, food diversity, culture, local economy, and interrelated global issues. This discussion can provide a deeper insight into the potential of Sago and how Sago can play a holistic role in achieving food sustainability in Pancakarsa village and other communities. Theoretical implications: The study of the consumption and role of Sago in household food security in Pancakarsa village can contribute to the literature and understanding of food sustainability, especially in the context of local food based on abundant natural resources. The results of this study can provide a further understanding of the dynamics of changes in food consumption patterns in society, especially in the context of a shift from traditional food to modern food. The



theoretical implications can also examine the role of culture and identity in maintaining and promoting the consumption of traditional foods such as Sago and how this can impact the conservation and sustainability of Sago resources.

**Managerial implications:** Producers and entrepreneurs in the food sector can use information on consumer preferences for Sago and rice to develop more effective marketing strategies. For example, to maintain and increase demand for Sago through innovation of Sago-processed products that are attractive and in line with consumer preferences. Understanding Sago consumption patterns can also provide input for local government policies in supporting the Sago sector's sustainable development, including empowering Sago farmers, improving production quality, and broader market access. The managerial implications can also involve the development of community-based Sago businesses in Pancakarsa village that can encourage local community participation and positively impact the economic and social welfare of the community. In addition, information on Sago and rice consumption patterns can also be helpful to food policy planning, especially in anticipating fluctuations in rice prices and availability and in managing the sustainability of Sago resources to ensure a stable and sustainable food supply.

**Conclusion:** Food consumption in Pancakarsa village has undergone significant changes over time. With its ease of presentation, Rice has replaced Sago as the preferred staple food for the community. Nonetheless, Sago still holds an essential value in the cultural and customary aspects of the local community. Respondents showed a high preference for processed Sago foods, especially *kapurung*, which is part of the cultural heritage that is still maintained. Household food consumption patterns in Pancakarsa village reflect the needs and preferences of the community, with rice being the primary choice due to its practicality. However, Sago remains a periodic consumption that has not yet been abandoned. Although Sago is consumed less as a staple food, its contribution to household food security is still moderate, while rice's contribution is high. This shows that Sago still has a significant role, although it is on a smaller scale. Information on Sago and rice consumption patterns has theoretical implications for understanding food sustainability, changes in consumption patterns, and the role of culture in maintaining traditional food. From a managerial perspective, this information can be used to develop better marketing strategies, government policies supporting local food sustainability, and growing Sago-based businesses in Pancakarsa village. This research provides valuable insights into local food consumption patterns and the dynamics of consumption change in the context of rural communities. It can serve as a foundation for further research and development in food and sustainability and inspire local communities to maintain and promote Sago as a vital part of their cultural identity.

**CRedit author statement:** All authors contributed equally to the conceptualization, methodology, and interpretation of the study results, ensuring a collaborative effort in every aspect of the research process. This shared involvement underscores the comprehensive approach taken in designing the study, implementing the methodology, and analyzing the findings. Their collective input enhances the validity and reliability of the research outcomes, reflecting a unified commitment to scholarly excellence.

**Conflict of Interest:** The authors declare no conflict of interest

**Acknowledgements:** We would like to thank every respondent in Pancakarsa Village, Mangkutana District, East Luwu Regency, South Sulawesi who was willing to be interviewed to provide information to complete the results of our research.

**Funding:** This research received no external funding

**Ethical statement:** This article does not contain any human or animal research

**Availability of data and materials:** We declare that the submitted manuscript is our original work, which has not been previously published and is not being considered for publication elsewhere.

**Code availability:** Not applicable.

**Consent to participate:** All authors participated in this research study.

**Consent for publication:** All authors submitted consent to publish this research article in JGIAS.

**SDGs addressed:** Zero Hunger, Good Health and Well-being, Gender Equality.

**Policy referred:** Local Food Diversification Policy; Household and Regional Food Security Policy, 3. Sustainable Agriculture and Resource Utilization Policy, 4. Rural Development and Welfare Policy.

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